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November 5, 1992

Ms. Donna R. Searcy  
Secretary  
Federal Communications Commission  
1919 M Street, N.W.  
Washington, DC 20554

Re: CC Docket No. 92-115  
Revision of Part 22 of the Commission's Rules  
Reply Comments  
The Ericsson Corporation

Dear Ms. Searcy:

Transmitted herewith, on behalf of The Ericsson Corporation, are an original and four copies of its "Reply Comments" in the above-referenced rulemaking proceeding.

Should there be any questions with regard to this matter, kindly communicate directly with the undersigned.

Very truly yours,



David C. Jatlow  
Counsel for The Ericsson  
Corporation

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**Before the  
Federal Communications Commission  
Washington, DC 20554**

FEDERAL COMMUNICATIONS COMMISSION  
OFFICE OF THE SECRETARY

In the Matter of

Revision of Part 22 of the  
Commission's Rules Governing  
the Public Mobile Services

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CC Docket 92-115

**Reply Comments of The Ericsson Corporation**

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November 5, 1992

## **Summary**

The Ericsson Corporation ("Ericsson") supports the Commission's efforts at reducing fraud in the cellular industry by requiring the cellular industry to establish certain technical specifications for cellular mobile equipment. Ericsson generally supports Section 22.919 as proposed by the Commission but believes that minor modifications to the proposed rule are necessary to allow the best possible service to the public without compromising protection against fraud.

Section 22.919(a) should be modified to specifically allow authorized service centers or representatives to make necessary and required changes to mobile and portable units in the field. By allowing authorized persons to make the necessary changes, the time and expense of accomplishing an ESN transfer through removing and shipping the unit back to the factory would be eliminated, benefiting both the subscriber and the provider. Also, subscribers will not be inconvenienced by not having access to their terminals and operators will not lose revenue because terminals are out of service for extended periods of time.

Proposed Sections 22.919(b) and (c) should also be revised to allow software in mobile and portable terminals to be altered by authorized factory service centers or representatives. This will enable a manufacturers and their authorized representatives to make software changes to the logic system and/or firmware in mobile and portable terminals to provide subscribers with new functions or enhancements.

Ericsson has adopted procedures to ensure that ESNs are not easily transferable through the use of an encrypted data transfer device that allows the ESN to exist in only one location at any time as well as the incorporation of a security fuse into the data transfer processor that permanently severs all external links to the processor memory to prevent the copying or modification of the operations of the transfer device. These procedures can be implemented in the field easily and quickly, and thus eliminate the need to send a cellular terminal back to the factory.

Sections 22.919(b) and (c) of the proposed rule should be revised to allow software to be altered by authorized factory service centers or representatives. This change will enable a manufacturer to make a software change to the logic system or firmware to upgrade a digital terminal to provide its customers with new functions or enhancements to existing functions.

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OFFICE OF THE SECRETARY

In the Matter of )  
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Revision of Part 22 of the )  
Commission's rules governing ) CC Docket 92-115  
the Public Mobile Services )  
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To: The Commission

**Reply Comments of The Ericsson Corporation**

The Ericsson Corporation, by its attorney, hereby submits its reply comments in response to the Notice of Proposed Rule Making in CC Docket No. 92-115<sup>1</sup> (hereinafter "NPRM"). In support of its reply comments The Ericsson Corporation states the following:

The Ericsson Corporation is a subsidiary of LM Ericsson and provides services in the United States for the Ericsson Group of companies.<sup>2</sup> Through Ericsson GE Mobile Communications Inc., a joint venture between Ericsson and General Electric, Ericsson manufactures and markets mobile and portable telephones for use with cellular radio systems. Ericsson's reply comments will be limited to the discussion of Section 22.919 which proposes to adopt certain standards for cellular mobile and portable

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<sup>1</sup> In the Matter of Revision of Part 22 of the Commission's rules governing the Public Mobile Services, 7 FCC Rcd 3658 (Released June 12, 1992).

<sup>2</sup> For purposes of its response to the NPRM all of LM Ericsson's subsidiaries and affiliates will be referred to collectively as "Ericsson" unless otherwise noted.

terminals<sup>3</sup> designed to prevent fraud.

Ericsson notes that the parties who filed comments in the initial round of this proceeding generally support proposed Section 22.919 as well as the Commission's goal of reducing fraud in the cellular industry by requiring the cellular industry to establish certain technical specifications for cellular mobile equipment.<sup>4</sup> Subject to the Commission making relatively minor modifications to Sections 22.919(a) through 22.919(c) as discussed in more detail below, Ericsson also supports the proposed rule because it believes adoption of technical standards in this area will help to combat fraud in the cellular industry.

**Section 22.919(a)**

Ericsson agrees with the comments of CTIA that the rule as presently written might unintentionally prohibit factory authorized service centers to make legitimate and necessary repairs to cellular mobile equipment in the field. This would be an untenable situation for cellular service providers and their subscribers. Unless Section 22.919(a) is modified to allow authorized persons to make necessary and required changes to mobile and portable units in the field, unnecessary time and

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<sup>3</sup> For purposes of this document "cellular terminal equipment" or "cellular mobile equipment" will refer to both cellular mobile units and cellular portable units.

<sup>4</sup> See, for example, Comments of GTE Service Corporation, Cellular Telecommunications Industry Association ("CTIA"), NYNEX Mobile Communications Company, Southwestern Bell Corporation, BellSouth Corporation and BellSouth Enterprises, Inc., and U.S. WEST NewVector Group, Inc.

expense will be expended to accomplish procedures which can efficiently be provided in the field. For example, if the rule remains as written, an ESN transfer would require a cellular mobile unit to be removed from a vehicle; shipped to a factory for repair, replacement and/or modification; shipped back to the cellular service provider or subscriber; and reinstalled in the vehicle from which it was originally removed. That process could take a substantial amount of time, during which the consumer would be unable to make or receive calls, resulting in inconvenience and the cellular service provider would lose revenue resulting from the cellular mobile unit being out of service.<sup>5</sup>

Because the scenario set out above would be costly for cellular subscribers and service providers alike, and because authorized factory representatives can transfer ESNs in the field in a matter of minutes, Ericsson submits, at a very minimum, the Commission should amend Section 22.919(a) to read as follows:

(a) The ESN must be factory set and must not be alterable, transferable, removable or otherwise able to be manipulated in the field, except by factory authorized service centers or representatives.

Ericsson notes that the Commission's goal in proposing Section 22.919 in general is to prevent fraud by ensuring that ESNs are not easily transferable. For cellular terminals it

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<sup>5</sup> Even if the cellular terminal was a portable unit, the cost and expense of shipping the unit to a factory would be incurred as well as the inconvenience of not having the unit available for use.

manufactures Ericsson has adopted procedures to make sure that ESNs are not easily transferable and are as secure as possible. Through the use of an encrypted data transfer device<sup>6</sup> the encryption code for each terminal is randomly acquired each time an electronic transfer is effected. Moreover, an "erase before write" protocol is used such that the ESN of the "old terminal" is erased before being written to the "new terminal". This ensures that the ESN cannot be cloned and used in another unit. In effect, the ESN is "transferred" to a new terminal rather than being "copied" to a new terminal. This ensures that the ESN exists in only one location at any time. Lastly, a security fuse is incorporated into the data transfer processor located within the data transfer device that permanently severs all external links to the processor memory after programming of the same to prevent the copying of, or modification to, the operations of the transfer device.

The foregoing procedures can be implemented quickly and easily in the field without the need to send a cellular terminal back to a factory. Ericsson submits that these and similar procedures can be implemented by major manufacturers of cellular

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<sup>6</sup> In ESN and other electronic transfers between cellular mobile and portable equipment, the "old" and "new" terminals are both connected to a "data transfer device". As soon as the ESN or other electronic information is successfully transferred from the old terminal to the data transfer device, the ESN or other electronic information is erased from the old terminal. Likewise, after the successful transfer of the information from the data transfer device to the new terminal the information is erased from the data transfer device.



mobile equipment. By the addition of the language which allows factory authorized service centers and their representatives to transfer ESNs in the field Ericsson is confident that fraud will be limited to the extent possible and unnecessary time and expense will not be imposed on cellular service providers or their subscribers.

**Sections 22.919 (b) and (c)**

Ericsson notes that Sections 22.919(b) and 22.919(c) must also be modified to prevent a situation which could be more problematical for the cellular industry than that of fraudulent use of ESNs.

As presently written Sections 22.919(b) and 22.919(c) would prevent any changes from being made to the logic system or firmware in a cellular mobile unit. In digital cellular mobile units the logic system and firmware provide the digital signal processing instructions which govern the operation of the terminal. In addition to converting electrical signals to voice, the logic system and firmware are responsible for a variety of functions, including but not limited to, those which affect the timing of the terminal; the sequence of operations; and the allocation of the terminal's memory and ability to access the same. In effect, the logic system and firmware of a cellular mobile transmitter govern virtually every aspect of the unit's operation.

The voice quality and overall performance of today's digital mobile units rely heavily on the operational instructions

programmed into the mobile's logic system and/or firmware.<sup>7</sup> When a manufacturer wants to upgrade a digital terminal to provide new functions or enhancements to existing functions a software change to the logic system or firmware is implemented. Literally interpreted, Sections 22.919(b) and 22.919(c) would prevent such software changes from being made--even if by the original manufacturer. Because Ericsson is confident that the Commission's intent could not be to prevent authorized software changes from being made to the logic system or firmware of cellular mobile transmitters which would inure to the benefit of the public, it suggests that Sections 22.919(b) and 22.919(c) be modified to read as follows:

(b) The ESN host component must be permanently attached to a main circuit board of the mobile transmitter and the integrity of the unit's operating software must not be alterable, except by authorized factory service centers or representatives. The ESN must be isolated from fraudulent contact and tampering, that component must not be removable, and its electrical connections must not be accessible. If the ESN host component contains other information, the ESN must be encoded using one or more of the following techniques:

- (1) multiplication or division by a polynomial;
- (2) cyclic coding;
- (3) the spreading of sequential ESN bits over various non-sequential memory locations.

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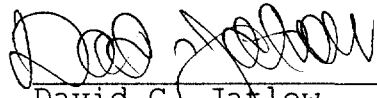
<sup>7</sup> With the rapid implementation of digital cellular technology software driven enhancements to cellular terminals will become even more common than they are today.

(c) Cellular mobile equipment must be designed such that any attempt to remove, tamper with, or change the ESN chip, its logic system, or firmware originally programmed by the manufacturer, except by authorized factory service centers or representatives, will render the mobile transmitter inoperative.

These changes will serve to prevent unauthorized changes to cellular mobile transmitters on the one hand, while still allowing cellular service providers to offer, and subscribers to receive, enhancements which will serve the public interest convenience and necessity.

Respectfully submitted,

The Ericsson Corporation

  
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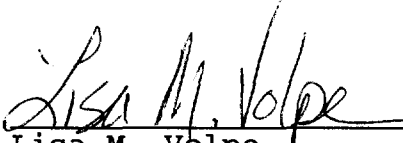
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